1. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{-5}{3}, \frac{3}{5}, \text{ and } \frac{-4}{3}$$

A. $a \in [42, 46], b \in [107, 114], c \in [12, 24],$ and $d \in [-67, -56]$

B. $a \in [42, 46], b \in [-42, -40], c \in [-92, -85],$ and $d \in [59, 61]$

C. $a \in [42, 46], b \in [9, 14], c \in [-111, -107],$ and $d \in [-67, -56]$

D. $a \in [42, 46], b \in [-114, -106], c \in [12, 24],$ and $d \in [59, 61]$

E. $a \in [42, 46], b \in [107, 114], c \in [12, 24],$ and $d \in [59, 61]$

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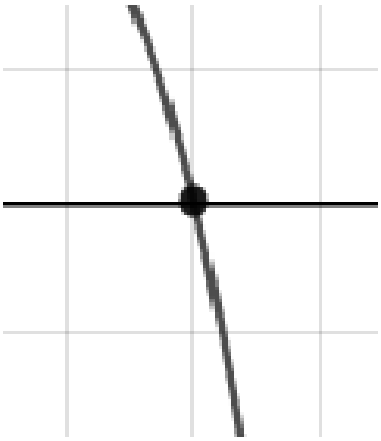
2. Describe the zero behavior of the zero $x = 6$ of the polynomial below.

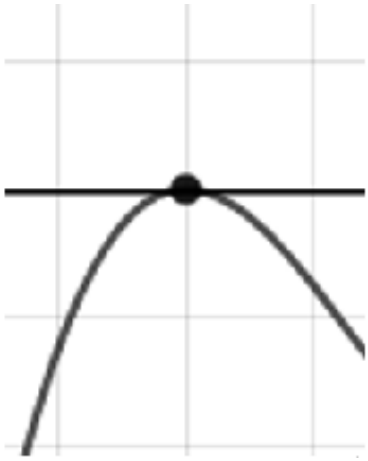
$$f(x) = -3(x + 5)^{10}(x - 5)^7(x - 6)^{12}(x + 6)^9$$

A.

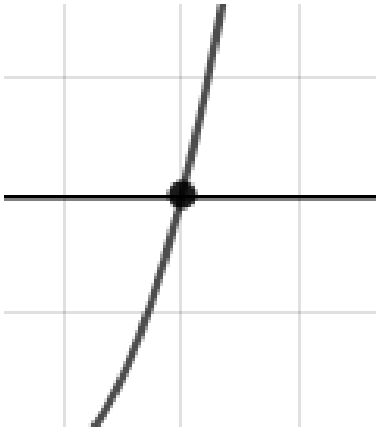


C.

B.



D.



E. None of the above.

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3. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$4 - 5i \text{ and } -2$$

A. $b \in [1, 2], c \in [6, 8],$ and $d \in [9, 16]$

B. $b \in [6, 8], c \in [22, 31],$ and $d \in [-87, -77]$

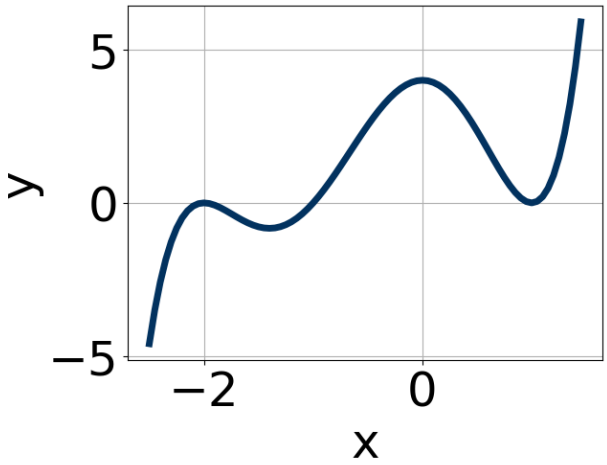
C. $b \in [1, 2], c \in [-8, 5],$ and $d \in [-12, -6]$

D. $b \in [-6, -2], c \in [22, 31],$ and $d \in [75, 87]$

E. None of the above.

---

4. Which of the following equations *could* be of the graph presented below?



A. $-8(x+2)^{10}(x-1)^6(x+1)^8$

B. $10(x+2)^6(x-1)^6(x+1)^5$

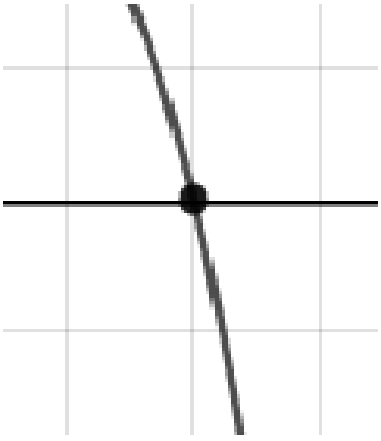
C. $-15(x+2)^6(x-1)^4(x+1)^9$

D. $5(x+2)^{10}(x-1)^{11}(x+1)^7$

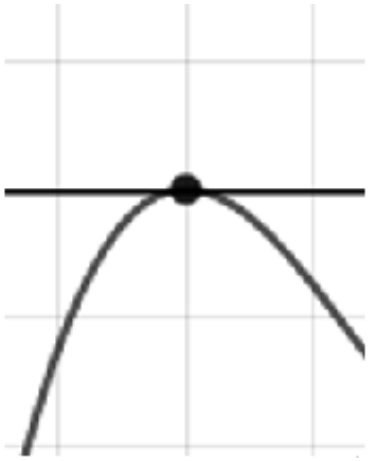
E. $15(x+2)^{10}(x-1)^9(x+1)^6$

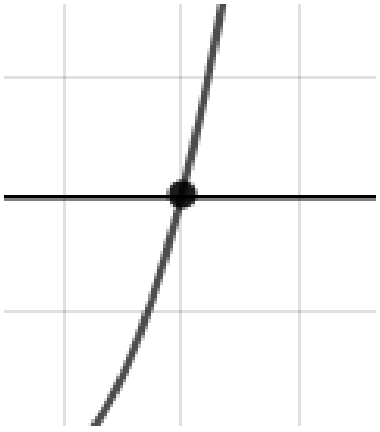
5. Describe the zero behavior of the zero $x = -6$ of the polynomial below.

$$f(x) = -9(x-6)^9(x+6)^{14}(x+3)^4(x-3)^6$$

A. 

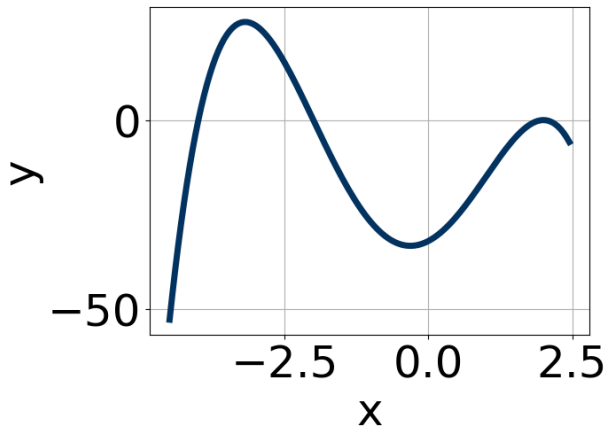
C. 

B. 

D. 

E. None of the above.

6. Which of the following equations *could* be of the graph presented below?



A. $13(x-2)^8(x+2)^{11}(x+4)^{10}$

B. $4(x-2)^6(x+2)^5(x+4)^9$

C. $-12(x-2)^{10}(x+2)^8(x+4)^7$

D. $-14(x-2)^7(x+2)^4(x+4)^9$

E. $-11(x-2)^6(x+2)^{11}(x+4)^7$

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7. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form x^3+bx^2+cx+d.

$$-5+4i \text{ and } -3$$

A. $b \in [-7,6], c \in [1,11],$ and $d \in [8,23]$

B. $b \in [-7,6], c \in [-6,2],$ and $d \in [-15,-11]$

C. $b \in [-22,-12], c \in [69,77],$ and $d \in [-125,-114]$

D. $b \in [10,21], c \in [69,77],$ and $d \in [115,125]$

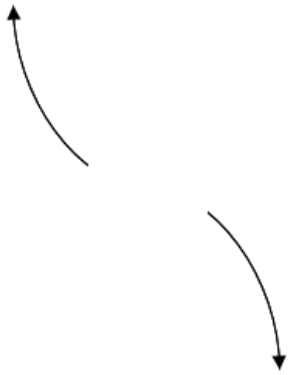
E. None of the above.

---

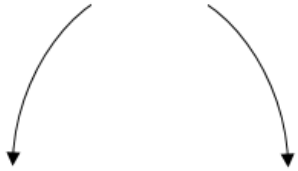
8. Describe the end behavior of the polynomial below.

$$f(x) = 2(x+9)^3(x-9)^8(x+5)^3(x-5)^4$$

A.

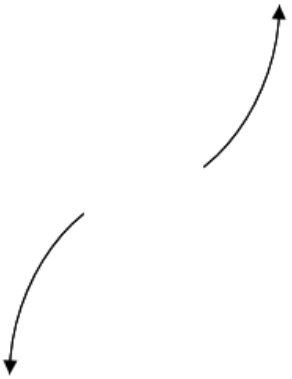


B.



C.

D.



E. None of the above.

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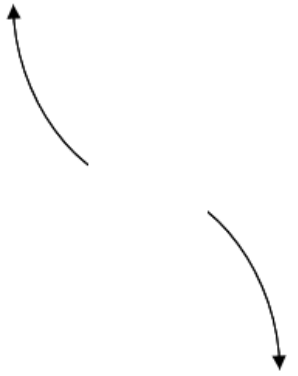
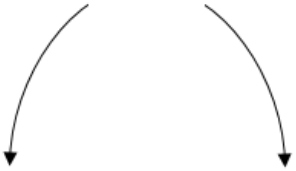
9. Describe the end behavior of the polynomial below.

$$f(x) = -7(x-4)^5(x+4)^6(x-5)^4(x+5)^6$$

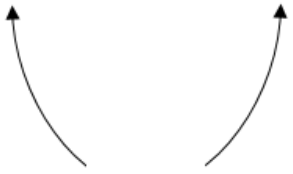
A.

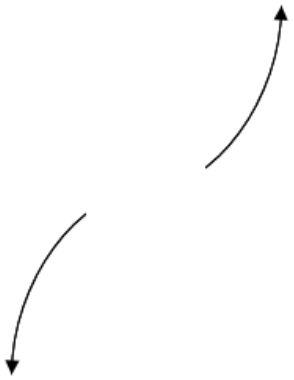


B.



C.



D. 

E. None of the above.

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10. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{-1}{3}, 1, \text{ and } \frac{-2}{5}$$

A. $a \in [10, 17], b \in [3, 11], c \in [-9.39, -8.23],$ and $d \in [-0.3, 4.6]$

B. $a \in [10, 17], b \in [10, 23], c \in [-1.88, -0.96],$ and $d \in [-2.8, -0.2]$

C. $a \in [10, 17], b \in [-7, -3], c \in [-9.39, -8.23],$ and $d \in [-2.8, -0.2]$

D. $a \in [10, 17], b \in [-7, -3], c \in [-9.39, -8.23],$ and $d \in [-0.3, 4.6]$

E. $a \in [10, 17], b \in [-18, -11], c \in [-4.09, -2.6],$ and $d \in [-0.3, 4.6]$
